NEW YORK STATE COLLEGE OF HOME ECONOMICS

Freezing Meat, Poultry, & Fish

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Freezing Meat,

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Poultry, & Fish

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FOR SUCCESSFUL FREEZING

1. Select good quality products to freeze. Freezing does not improve the quality of any food.
2. Prepare the products for freezing according to recommended directions.
3. Moisture-vapor-resistant packaging materials and proper packaging are essential to maintain quality of the frozen product.
4. Label all food with the name of the product, date frozen, number of servings or weight, and any other pertinent information.
5. Keep an inventory of all the food frozen.
6. Arrange food in the freezer so that it can be found easily and quickly.
7. Freezer temperature should return to 0°F. or lower within 24 hours after the food has been put in to freeze, otherwise the freezer is overloaded.
8. The freezer storage temperature should be steady at 0°F. or lower to maintain the original quality of the food.
9. For economical operation keep the freezer full most of the time.

Freezing is a convenient, time-saving way to preserve food—food that may be home-produced or purchased. In either case, only good quality fresh products should be selected for freezing.

Freezing does not improve the quality of any food, but properly frozen meat, poultry, and fish compare favorably with the fresh products in color, flavor, texture, and nutritive value. Initial quality can be maintained by using recommended wrapping and packaging materials and storing at a temperature of 0°F. or lower.

Careful packaging for freezing, which includes proper sealing, will help prevent rancidity and freezer-burn. Rancidity is caused by oxidation of the fat. Freezer-burn is due to loss of moisture. Freezer-burned meat and poultry will have lost weight, appear dry, and be tough and tasteless.

A constant storage temperature of 0°F. or lower is another important factor in retaining quality in frozen meat, poultry, and fish.

Good packaging and low temperature protect against:

- Chemical changes caused by exposure of the frozen food to air, resulting in loss of color and development of off-flavors.
- Physical changes caused by loss of moisture, resulting in loss of weight and fresh appearance.

WRAPPING AND PACKAGING MATERIALS

- A good quality wrapping material is moisture-vapor resistant—it protects food from loss of liquid, flavor, and odor and from absorbing foreign odors and flavors
- It does not absorb fat, water, or blood
- It does not impart a flavor of its own
- It is clean, durable, and pliable at low temperatures

ALUMINUM FOIL. Freezer-type foil is an excellent wrap for meat, poultry, and fish. The foil can be molded to the many shapes of these products, and it meets many of the requirements for a good wrapping except that it may tear and puncture. If there is much handling of the frozen foil-wrapped packages, an outer wrap of ordinary wrapping paper is desirable. To label a foil-wrapped package, use a small piece of freezer tape.

LAMINATES. Many types of laminated (layered) wrappings, which combine the desirable qualities of two or more materials, are available. Some of these are: polyethylene, cellophane, pliofilm or glassine laminated to kraft paper, and aluminum foil laminated to a paper base. When a laminated paper is used for wrapping, it should be sealed with freezer tape across the folded ends. It is easy to label the outside of the package.

POLYETHYLENE WRAPPINGS AND BAGS. Polyethylene is transparent, pliable at low temperatures, and meets the other requirements for freezer packaging. Sheets used for wrapping need to be sealed with freezer tape along the folds and over the ends. The tape should be a masking-type that can be used as a label also.

Bags of polyethylene are sold in various sizes. These bags are easily sealed: expel as much air as possible; then twist the top of the bag tightly, bend it over, and secure it with a rubber band. Clean polyethylene bags without holes may be reused. Just before reusing, sterilize them by immersing for 10 to 15 minutes in a mixture of 1 teaspoon of chlorine solution in a quart of water.

CELLOPHANE. Freezer-type cellophane meets most of the requirements for freezer packaging. Cellophane is somewhat brittle at low temperatures and may split or tear. It can be heat-sealed or sealed with freezer tape. The package must be protected by stockinet or ordinary wrapping paper during storage. Cellophane cannot be used a second season because it tends to become brittle.

SARAN-TYPE WRAP. Saran-type material is an excellent moisture-vapor-resistant wrapping. Its tendency to cling makes it easy to exclude air from a package. It must be sealed with freezer tape along the fold and over the folded ends. Since a saran-type wrapping may become brittle at low temperatures, it is desirable to overwrap the package with ordinary wrapping paper.

CONTAINERS. Polyethylene boxes, polyethylene bags in boxes, glass freezer jars, and coffee and shortening cans that can be sealed with freezer tape are containers suitable for such products as ground meat, liver, and partially-boned poultry. When these containers are reused, they should be sterilized. See above for directions for sterilizing polyethylene bags. The same method may be used for sterilizing polyethylene boxes. To sterilize glass and metal containers, invert them in a shallow pan of water and boil for 15 minutes.

LABELING

Every package of meat, poultry, or fish should be labeled to show the name of the product, the cut, and the date of freezing. It is well to indicate the number of pieces, servings, weight, or other pertinent information on the label. On packages wrapped in foil, polyethylene, cellophane, or saran-type wrap, use a strip of freezer tape for the label; on laminated wrappings, write on the outside of the packages. A glass marking pencil or a colored crayon is good for writing the label.

TIPS ON PACKAGING

- Force as much air as possible out of the packages while wrapping. Air trapped in packages will cause drying, change of color, and loss of flavor in meat, poultry, and fish.
- Remove as many bones from meat and poultry as possible since they take up valuable freezer space. Moreover, research has shown that bones do not enhance the flavor of meat and poultry.
- Before packaging, pad the sharp points of bones with several folds of polyethlyene or other freezer wrapping material to prevent punctures in the wrapping.
- Sterilize reusable material or containers before using. (See page 5.)
- Place two layers of freezer wrapping materials between slices of meat, meat patties, or pieces of chicken for frying or broiling. This will facilitate thawing and separation of the pieces. Steaks will thaw faster if packaged flat rather than rolled or folded.
- Small packages will freeze faster than large ones.
- Packages of fresh meats and poultry as commonly purchased in retail stores are not suitably wrapped for freezing. Before freezing, rewrap these products in one of the recommended wrapping materials.
- Package ground meats, unsalted, in bulk or made into patties in amounts suitable for the family's use. Salt hastens the development of rancidity of the fat in frozen meats. Ground pork for sausage may be mixed with spices.
- Package tongue or heart as you would wrap a roast or another piece of meat. Individual servings of liver may be wrapped in pieces of pliable material and then put into polyethylene bags, waxed cartons, glass jars, or tin cans for storage. Liver may be frozen unsliced in family-size amounts that will slice easily in the partially-thawed state.
- Package cured meat in the same way you package other meat for freezer storage.

FREEZER STORAGE FOR MEAT, POULTRY, AND FISH

Zero or lower is the best temperature for storing frozen meat, poultry, and fish. Research has shown that fluctuating temperatures from zero to 10° or 20°F. will not keep foods at their best. The higher the temperature rises above zero, the faster the foods will deteriorate in flavor, color, texture, and nutritive value. The damage caused by intermittent warming usually is apparent upon opening the package. Frost accumulation inside a package indicates that the storage temperature has fluctuated. Although the damage caused by above-zero temperatures is permanent, any further damage can be prevented by holding the temperature at zero or lower. The storage temperature in your freezer may be checked occasionally with a thermometer.

Salt hastens the development of rancidity so the storage life of cured meat is short. If you have freezer space, you may wish to prolong the keeping time of cured meat by freezing it, especially during the summer. Cured meat should not be frozen at the expense of fresh meat preservation.

TABLE 1. MAXIMUM STORAGE TIMES FOR FROZEN MEAT, POULTRY, AND FISH AT 0°F.*

Product	Months	Product	Months
Meat, fresh		**Meat, smoked**	
Beef, steaks or roasts	9 – 12	Bacon, sliced	do not freeze
Beef, ground	4 – 6	Bacon, slab	1 – 3
Lamb	9 – 12	Ham, whole	1 – 3
Pork	6 – 9		
Pork sausage	1 – 3	**Poultry, fresh**	
Beef or lamb liver	3 – 4	Chicken, ready-to-cook	6 – 7
Pork liver	1 – 2	Giblets	2 – 3
Heart	2 – 4	Turkey, ready-to-cook	4 – 5
Veal	4 – 6	**Fish**	1 – 2

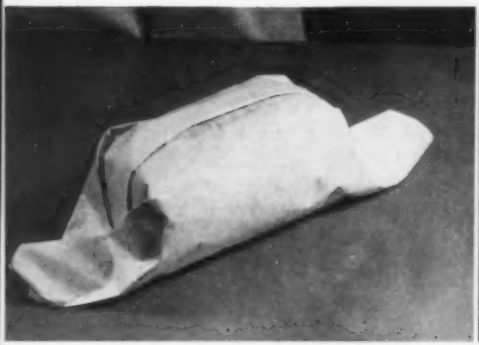
*Adapted from material prepared by Faith Fenton, professor emeritus of the New York State College of Home Economics. These suggested storage times assume that the meat, poultry, and fish were correctly prepared and handled.

REFREEZING MEAT, POULTRY, AND FISH

Meat and poultry that have thawed may be refrozen if the temperature of the thawed product has not reached 50°F. Quality will be impaired but the food will be safe to eat. Fish, completely thawed, should not be refrozen.

1. Place the food in the center of a sheet of foil, saran-type or laminated paper.

2. Bring the two sides of the wrapping material together.



5. Fold in both ends of the wrapping, excluding as much air as possible.

6. Fold the ends under the package to make a tight wrap.

DRUGST

1. Place the food at the end of the paper, near a corner.

2. Fold the corner over the food.

3. Fold one si

BUTCHE

3. Fold the paper over to make a lock-fold.

4. Continue to fold, drawing the wrapping tightly around the food; press the fold flat against the food.

7. Fold the pointed ends over and seal with freezer tape.

8. Label the package, including the kind of meat, poultry, or fish, the cut, the weight or number of servings, and the date.

E WRAP

cross.

4. Roll the package over halfway, then fold the other side across.

5. Roll the package over to complete the wrap; fold the pointed end over and seal with freezer tape; label.

WRAP

PLANNING FOR MEAT FREEZING

When you plan to freeze meat you will want to consider the following:

1. *The kinds of meat to freeze.* The kinds of meat frozen will depend on the family preferences.
2. *How much meat to freeze.* The amount of meat frozen will depend on:
   - The number and ages of the family members. For example a family of five with three school-age children, 10 to 13 years, will need about 13 pounds of meat, poultry, or fish per week or about 700 pounds a year.
   - The size of the freezer. Space for meat in your freezer will need to be planned for in advance if you want to store a part or a whole carcass of meat. One cubic foot of space will hold 35 to 40 pounds of meat. As the meat is removed, the freezer space may be used for other foods. A freezer kept relatively full reduces storage cost per item.
3. *Facilities available for freezing and storage.* The size of the freezer will determine the amount of meat that you can freeze at one time safely. Overloading the freezer can damage its mechanism and lower the quality of the meat and of the other stored food. If the freezer temperature does not return to 0°F. within a 24-hour period after you put the food in to freeze, the freezer was overloaded. See the manufacturer's directions for the amount of meat that can be handled in your freezer. You may need to make arrangements with a commercial concern to freeze or refrigerate the meat in excess of the amount that you can care for properly at one time.
4. *Seasonal availability.* Plan to freeze the meats of your choice when they are lowest in price and available in largest quantities. Beef prices normally reach their seasonal low in March or April and then start to rise. Early spring is usually a good time to put beef in the freezer. Veal prices usually decline after February; pork prices decline seasonally, reaching their lowest point in December or January; lamb prices are frequently lowest from December through February.

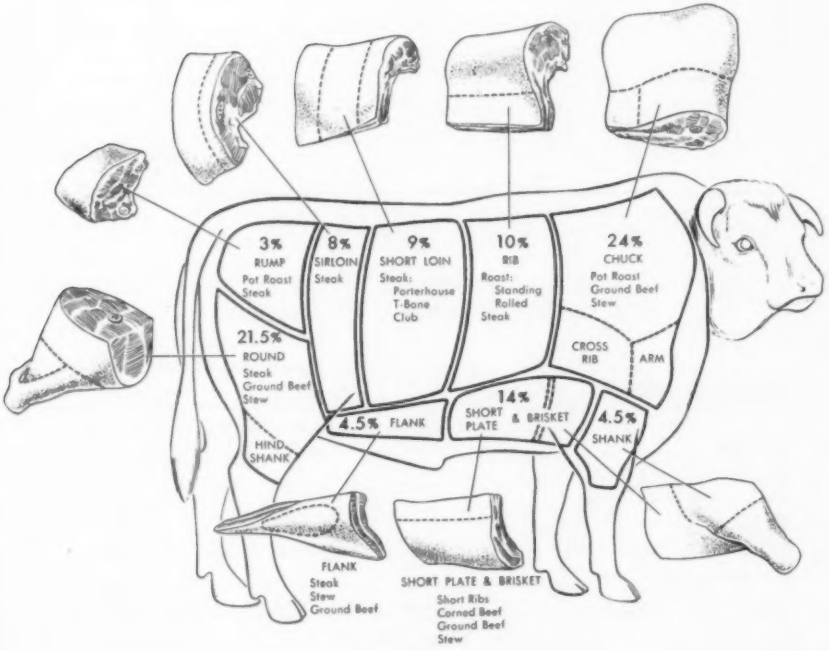
FREEZING MEAT

HOME-PRODUCED

The meat—beef, veal, pork, or lamb—that you freeze may be produced on your own farm. By planning ahead, you can have enough home-processed meat of the quality you desire. If you want meat of high quality, animals for slaughter must be healthy, young, and well-finished. Such animals yield tender, juicy meat, if it is properly processed, frozen, and stored.

Aging. An aging period of 5 to 7 days is usually long enough for beef and lamb that are to be frozen. If they are held longer, loss of weight from shrinkage is apt to be excessive and molds may develop on the exposed lean surfaces, producing undesirable odors and flavors. Pork and veal should not be aged, but cut, packaged, and frozen as soon as the carcasses are thoroughly chilled.

Aids to meat cutting. It will be to your advantage to know the cuts of meat which can be obtained from meat animals whether you cut up the carcass yourself or have it done. For example, the Beef Chart below shows the wholesale cuts and the percent of each in a beef carcass. The retail cuts most commonly obtained from the wholesale cuts are also indicated. It is well to know what cuts you want and then cut them in sizes to suit your family's needs.



BEEF CHART

Cutting beef carcasses for freezing. A 1000 pound steer will yield about 580 pounds in the carcass (hindquarters—278 pounds, forequarters—302 pounds). This carcass in turn will yield about 435 pounds of retail cuts. The 145 pounds difference (25 per cent) between the carcass and the retail cuts is due to fat, bone, and cutting shrinkage. This may vary considerably depending on the amount of fat and bone removed during the processing of the retail cuts.

TABLE 2. APPROXIMATE WEIGHTS OF THE CUTS OBTAINABLE FROM THE HINDQUARTER OF A BEEF CARCASS

ONE HINDQUARTER=139 POUNDS	Weight of cut, less cutting and trimming losses	
	25 per cent loss*	20 per cent loss*
	pounds	pounds
Short loin—		
porterhouse, T-bone, and club steaks	19.5	21.0
Sirloin, steaks or roasts	17.5	18.5
Round, steaks or roasts	31.0	34.0
Rump, roasts	6.5	7.0
Flank	2.0	2.0
Ground or stew beef	27.5	28.5
Total weight of cuts	104.0	111.0
Fat, bone, and cutting loss	35.0	28.0
TOTAL	139.0	139.0

*Per cent loss will depend upon amount of trimming in cutting the carcass

TABLE 3. APPROXIMATE WEIGHTS OF THE CUTS OBTAINABLE FROM THE FOREQUARTER OF A BEEF CARCASS

ONE FOREQUARTER=151 POUNDS	Weight of cut, less cutting and trimming losses	
	25 per cent loss*	20 per cent loss*
	pounds	pounds
Rib roasts	16.0	17.5
Short ribs	4.0	4.0
Chuck, steaks or roasts	42.0	45.5
Brisket	14.5	15.5
Plate	15.0	16.0
Ground or stew beef	21.5	22.5
Total weight of cuts	113.0	121.0
Fat, bone, and cutting loss	38.0	30.0
TOTAL	151.0	151.0

*Per cent loss will depend upon amount of trimming in cutting the carcass

Cutting pork carcasses for freezing. A live pig weighing 220 pounds will yield a carcass weighing about 155 pounds.

TABLE 4. APPROXIMATE WEIGHTS OF THE CUTS OBTAINABLE FROM A PIG CARCASS WEIGHING ABOUT 155 POUNDS

Cuts	Per cent of carcass	Pounds
Hams	18.0–20.0	28.0–31.0
Loins	14.0–16.0	22.0–25.0
Picnics	6.0– 8.0	9.0–12.0
Boston butts	6.0– 8.0	9.0–12.0
Bacon or belly	12.0–14.0	19.0–22.0
Fat	17.0–20.0	26.0–31.0
Lean trimmings	4.0– 5.0	6.0– 8.0
Spareribs and neck bones	4.0– 5.0	6.0– 8.0
Jowl	2.0– 3.0	3.0– 5.0

PURCHASED

When purchasing meat to freeze, some items to consider are:

1. *The cost of wholesale cuts* compared with retail cuts as shown in Tables 5 and 6.
2. *Family preferences for certain retail cuts* rather than all the cuts from a large wholesale piece.
3. *Quality.* Wholesale cuts of meat, especially beef and lamb, are available labeled with the grades of the United States Department of Agriculture or the packer's grades. Grades are valuable guides to follow when purchasing meat. Meat graded U.S. Choice and U.S. Good, or similar packer grades, are recommended for freezing. The lean, fat, and bone of beef of desirable quality for freezing will have the following characteristics:
   - The lean will be well marbled, bright red in color, fine textured, and reasonably firm.
   - The fat will be of uniform thickness over the external parts of the carcass, creamy white in color, and somewhat brittle.
   - The cut surfaces of the flat bones will appear red and porous and the ends will be tipped with soft, white cartilage.

4. *Price.* Should you buy part of a carcass or should you buy retail cuts for freezer storage? Table 2 shows the cuts and the approximate weights that you can expect from a hindquarter of beef weighing 139 pounds. For cost comparison of a hindquarter of beef purchased as a wholesale cut and processed for freezing, or purchased as retail cuts, see Tables 5 and 6. The costs of these cuts are based on prices in New York State during the spring of 1959.

TABLE 5. COST OF WHOLESALE CUTS FROM A HINDQUARTER OF BEEF PLUS FREEZER STORAGE COSTS

ONE HINDQUARTER=139 POUNDS	Cost per pound	Total cost
139 pounds	$ .57	$ 79.23
Processing—cutting, wrapping, labeling	.08	11.12
Cutting losses, boning, waste fat amount to 35 pounds, 104 pounds meat left for freezing		
Freezer storage cost (104 pounds)*	.10	10.40
TOTAL (104 pounds)		$100.75

Approximate cost of one pound — $ .97

*Based on frequent turnover

TABLE 6. COST OF RETAIL CUTS FROM A HINDQUARTER OF BEEF PLUS FREEZER STORAGE COSTS

Cuts of beef from hindquarter as sold at retail—104 pounds	Weight in pounds	Cost per pound	Total cost
Porterhouse, T-bone	19.5	$ 1.19	$ 23.21
Sirloin, steaks or roasts	17.5	1.10	19.25
Round, steaks or roasts	31.0	1.19	36.89
Rump, roasts	6.5	.99	6.44
Flank	2.0	.89	1.78
Ground or stew beef	27.5	.49	13.48
	104.0		
Packaging materials		.02	2.08
Freezer storage cost*		.10	10.40
			$113.53

Approximate cost of one pound — $1.09

*Based on frequent turnover

Your decision whether or not to buy meat for your freezer may be based on one or both of the following considerations:

- The economy of special buys. Quick-cooking cuts, such as steaks, fluctuate more in price than longer cooking cuts, such as pot roasts.
- The convenience of a meat supply in the freezer. This may compensate for a little higher cost of the meat.

FREEZING POULTRY

Chickens and turkeys can be frozen at the stage of maturity you prefer. Select only healthy, plump, well-fattened birds of the age and weight best suited to the family's needs. Chickens may be frozen as broilers or fryers at 8 to 10 weeks of age and as roasters at 3 to 5 months; chickens beyond this age may be frozen for stewing. Turkeys may be frozen for roasting at 6 to 7 months. Ducks are usually frozen for roasting only at 6 to 8 weeks. Frozen poultry may be stored successfully at 0°F. or lower for several months. (See Table 1, page 7.)

Fresh poultry purchased for freezing should be rewrapped in a recommended freezer wrapping material.

Darkened bones sometimes develop in young poultry, an unexplainable effect of freezing on the hemoglobin in the bone marrow. This darkening detracts from the appearance of the bird, but does not affect the flavor or keeping quality.

Poultry meat sometimes darkens when frozen. This is apparently due to an insufficiently low freezing temperature. To prevent this darkening, freeze chickens at −10°F. and turkeys at −20°F. or lower.

YOUNG POULTRY FOR BROILING. Split the birds down the center of the back, and along the keel or breastbone. Place two pieces of freezer wrapping material between the halves for ease in separating them while frozen. Wrap the two halves in one of the suggested wrapping materials (pages 4 and 5), pressing out as much air as possible. Label and freeze at once.

CUT-UP POULTRY. Cut the birds into pieces and wrap each piece in a pliable freezer wrap. Pieces of stewing chicken do not need to be wrapped individually first. Fit pieces into a compact pile, place in center of freezer wrapping material, and package as shown on pages 8 and 9. To save freezer space, you may wish to package only the meaty pieces. Pack individually wrapped pieces into a quart polyethylene bag placed in a pasteboard carton. Press out as much air as possible from the bag and close tightly with a rubber band before closing the carton. Label and freeze at once. The bony pieces may be cooked, the meat removed and used immediately or frozen with the concentrated broth. Giblets are best used fresh. If they are to be frozen, put them in a separate package as they may impart a flavor to the rest of the poultry.

ROASTERS. These birds are prepared for freezing the same way they are prepared for immediate roasting. Any excess fat around the abdominal cavity should be removed to retard deterioration. Tie the wings and legs close to the body so that the wrapping can be fitted snugly around the bird. Wrap in one of the recommended freezer wrapping materials, following the directions on pages 8 and 9.

Do not stuff poultry before freezing it. Research has shown that bacteria grow rapidly in stuffing that has been contaminated by handling. It is best to stuff the frozen bird after it is thawed just before you place it in the oven; or bake the dressing in a separate pan.

FREEZING FISH

Prepare fish for freezing the same as for cooking—scale, eviscerate, remove head and fins, wash thoroughly, and drain. Freeze small fish whole. Large fish may be cut into steaks or fillets. Place two layers of freezer wrapping material between individual fish, steaks, or fillets so that they may be easily separated when ready to cook. Wrap the fish in moisture-vapor-resistant paper following the directions on pages 8 and 9. Freeze the fish quickly and promptly at 0°F. or lower. Store the fish also at 0°F. or lower. (See Table 1, page 7.)

Whole fish may be ice-glazed for protection during freezer storage. First place the cleaned and eviscerated unwrapped fish on a tray in the freezer; as soon as the fish is frozen, dip it in near-freezing ice-water. Place the fish again in the freezer a few minutes to harden the glaze. Take fish out and repeat the dipping. When a good glaze (uniform ice coating about $\frac{1}{8}$-inch thick) has been formed, wrap the fish in freezer wrapping paper, and store it in the freezer. Glazed fish should be wrapped for protection against chipping and evaporation during storage. Wrapped fish may be frozen and stored without affecting the flavor of other foods in the freezer.

Cooperative Extension Service, New York State College of Home Economics at Cornell University and the United States Department of Agriculture cooperating. In furtherance of the Acts of Congress May 8, June 30, 1914. M. C. Bond, Director of Extension, Ithaca, New York.